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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/464,076	12/16/1999	BRIAN CRUICKSHANK	91436-209	7105

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EXAMINER	
HAN, QI	

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/464,076	CRUICKSHANK, BRIAN	
	Examiner	Art Unit	
	Qi Han	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Response to Amendment

2. The Applicant(s) amended claims 1-2 and 6, 9-12, and 14, added new claims 21-24 (see the amendment: pages 3-5), and filed the RCE examination request on 09/10/2004.

3. Examiner withdraws the claim rejection under 35 USC 112 2nd, because applicant made amendment and/or correction.

Response to Arguments

4. Applicant's arguments with respect to claims 1-20 (the amendment: pages 16-20) have been considered, but are moot in view of the new ground(s) of rejection, since the amended independent claims include new issue(s).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4-6, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman (US 5,774,854) in view of Hata et al. (US 5,878,393) hereinafter referenced as Hata and "new riverside university dictionary" hereinafter referenced as DIC.

Regarding **claim 1**, Sharman discloses a text to speech system, comprises:

receiving a list of textual units, wherein said textual units in the list comprise words, prefixes and suffixes, (column 2, lines 1-2, 'a linguistic processor for generating a listing (list) of speech segments (textual units) ... from the input (received) text'; column 5, lines 18-27, 'removing (separate) **any possible prefix or suffix**, to see if the **word**, is related to one that is already in the dictionary');

for each textual unit in the list, locating an associated speech sample in memory, said memory comprising vocabulary of words, prefixes and suffixes and a plurality of speech samples (column 5, lines 'using a dictionary look-up (necessarily stored in memory)', 'breaking words down into syllables' and 'removing any possible prefix and suffix (also necessarily stored in a buffer or memory in order to produce output speech)'; column 6, lines 25-67, 'many samples (associated speech sample) of each diphone are collected', 'the relevant diphone are the retrieved (located) from the diphone library (necessarily stored in a memory) and concatenated together by

the diphone concatenation unit 415 (PSOLA)'; Table 1 and column 7, lines 54-67, 'the output buffer (memory) is used when a component produces **several output units** for each input unit that receives', including 'token', 'word', 'phoneme', 'syllable', see column 7, table 1); and

appending said associated speech sample to an output signal, (column 6, lines 25-67, 'concatenated together (appending) by the diphone (associated sample) concatenation unit 415 (PSOLA)', and 'produces the acoustic waveform (output signal)').

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not expressly disclose "**each speech sample** corresponding to a one of said **words**, ... in said vocabulary". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds recorded and stored in advance", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system is capable of using larger units (such as word) or smaller units (such as phoneme) of speech sample, and that "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Hata also discloses data structure(s) including arrays, such as the dictionary, word list and phonologic feature table (see Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "each speech sample corresponding to a one of said ..., **prefixes and suffixes** in said vocabulary". However, the feature that a prefix or suffix being an entry treated as same way as a word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Regarding **claim 4** (depending on claim 1), Sharman further discloses that processing input text at the substring level is based on a syllabified word (Sharman: column 5, line 31), so that combining the prior art features as applied above, the combined system satisfies all limitations as the claimed "for each textual unit in said consecutive plurality of said textual units, locating an associated speech sample in said memory; creating a speech unit by splicing together said plurality of associated speech samples; and appending said speech unit to said output signal."

Regarding **claim 5** (depending on claim 4), Sharman further discloses components of identifying diphones 410 (Fig. 4), diphone library 420 and diphone concatenation 415 for

overcoming audible discontinuities (column 6, lines 34-40), which corresponds to the claimed "after said splicing, processing said speech unit to remove discontinuities."

Regarding **claim 6**, Sharman discloses a text to speech system, by using a linguistic processor for various linguistic processes (Figs. 2-3), comprising:

receiving a text file, (column 2, line 2-3, 'input text'; column 5, lines 1-2, 'obtain input from a source, such as ... a stored file');

parsing said text file into textual units, where each said parsed textual unit is one of a word, a prefix and a suffix, (column 5, lines 3-40, 'split input text into tokens (**words**)', implement special rules 'to map lexical items into canonical **word form**', 'using a dictionary look-up', 'remove any possible **prefix** or **suffix**'); and

for each one of said parsed textual units, if said one of said parsed textual units corresponds to a stored textual unit in a vocabulary of textual units, and adding said stored textual unit to a list, (column 2, lines 1-2, 'generating **a listing** (list) of speech segments (equivalent textual units) ... from the input text', herein the list is inherently stored in a buffer; column 5, lines 26-27 'to see if the word is related to one that is already in the dictionary'; column 6, lines 61-66 and column 7, Table 1, 'output unit represents the size of the **text unit** (including word, phoneme)' used for different process stages; column 7, lines 45-66, '**output buffer** is also used when a component produces several outputs units for each input unit that it receives', herein inherently including adding prefix and suffix to the buffer because without storing them in the buffer the system cannot output required speech).

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not

expressly disclose "wherein said vocabulary of textural unit comprises **words** ... **each having a** pre-recorded speech sample associated therewith". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds (speech sample) recorded and stored in advance (pre-recorded)", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system is capable of using larger units (such as word) or smaller units (such as phoneme) of speech sample, and that "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Hata also discloses data structure(s) including arrays, such as the dictionary, word list and phonologic feature table (see Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "wherein said vocabulary of textural unit comprises ... **prefixes and suffixes** each having a pre-recorded speech sample associated therewith". However, the feature that a prefix or suffix being an entry treated as same way as a word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would

have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67)Regarding **claim 9**, it recites an apparatus, which corresponds to the method of claim 1. The rejection is based on the same reason as described for claim 1, because claim 9 recites same or similar limitation(s) as claim 1.

Regarding **claim 10**, it recites an apparatus having a processor (see preamble) that is read on the Sharman's disclosure "the TTS system includes two microprocessors (column 3, line 17)". For rest of the limitations, the rejection is based on the same reason as described for claim 1, because claim 10 recites same or similar limitation(s) as claim 1.

Regarding **claim 11**, it recites a computer readable medium for providing program control to a processor included in a text to speech converter (see preamble) that is read on the Sharman's disclosure that an arrangement is particularly suitable for a workstation (equivalent to computer) equipped with an adapter card with its own DSP (equivalent to processor) (column 3, line 21). For rest of the limitations, the rejection is based on the same reason as described for claim 1, because claim 9 recites same or similar limitation(s) as claim 1.

Regarding **claim 12**, it recites an apparatus, which corresponds to a combination of the method of claim 1 and the method of claim 6. The rejection is based on the same reason as described for claims 1 and 6, because claim 12 recites same or similar limitation(s) as claims 1 and 6.

Regarding **claim 13**, it is canceled.

6. Claims 2-3 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata and DIC as applied to claims 1 and 12 above, and further in view of Oh (US 6,141,642).

Regarding **claim 2** (depending on claim 1), Sharman in view of Hata and DIC further discloses:

wherein when a one of said textual units in said list is indicated as not having an associated speech sample in memory, passing said indicated textual unit (column 5, lines 24-26, 'it is useful to include some back-up mechanism to be able to process (pass) words that are not in the dictionary'); and

"appending said converted speech sample to said output signal" (as applied in claim 6).

But, Sharman in view of Hata and DIC does not expressly discloses "passing said indicated textual unit to a **secondary text to speech engine**; receiving a speech sample converted from said indicated textual unit from said secondary text to speech engine". However, this feature is well known in the art as evidenced by Oh who discloses text-to-speech apparatus and method for processing multiple languages (title), comprising a plurality of test-to-speech engines for converting the sub-texts into audio wave data (speech sample)(column 1, line 65 to column 2, line 5), and illustrates a structure (Fig. 2) having two TTS engines, wherein when a character (text unit) of other language is detected the control is transferred to the other TTS engine (secondary TTS), including lexical analysis, parsing, converting the input (received) text (column 4, lines 23-53, and column 5, lines 1-10). Therefore, it would have been obvious to one

of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata and DIC by specifically providing a secondary TTS for further processing the unmatched text, for the purpose of generating appropriated sound for a multiple language text (Oh: column 1, lines 57-58)

Regarding **claim 3** (depending on claim 2), Sharman in view of Hata, DIC and Oh discloses that said secondary text-to-speech engine comprises a phonetic text-to-speech engine based on a **voice talent**, (Hata: Fig. 1 and column 3, 42-45,' the reading system has a dictionary of sampled sounds 40'; column 3, line 26-31, 'the individual speech samples (equivalent to voice talent) each represent discrete units of speech, such as phonemes or words').

Regarding **claim 21**, it recites a method, which corresponds to a combination of claims 1-2; the rejection is based on the same reason as described for claims 1-2, because the claim recites same or similar limitation(s) as claims 1-2.

Regarding **claim 22** (depending on claim 21), the rejection is based on the same reason as described for claim 6, because the claim recites same or similar limitation(s) as claim 6.

Regarding **claim 23**, it recites an apparatus, which corresponds to a combination of method claims 1, 2 and 6; the rejection is based on the same reason as described for claims 1, 2 and 6, because the claim recites same or similar limitation(s) as claims 1, 2 and 6.

Regarding **claim 24**, (depending on claim 21), the rejection is based on the same reason as described for claim 1, because the rejection for claim 1 covers same or similar limitation(s) of this claim.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata and DIC as applied to claim 6 above, and further in view of Microsoft Press ("Computer Dictionary", page 298) hereinafter referenced as R1.

Regarding **claim 7** (depending on claim 6), Sharman particularly discloses that apart from using a dictionary look-up, "it is useful to include some back-up mechanism to be able to process words that are not in the dictionary" (column 5, lines 24-26), which is corresponding to the claimed "if said one of said parsed textual units does not correspond to one of said stored textual units" and "as being out of vocabulary." Sharman further recites that "the output unit represents the size of the text unit (e.g. word, sentence, phoneme); for many stages this is accompanied by additional information for that unit (e.g., duration, part of speech etc.)" (column 6, line 59 to column 7, line 2), which means that the text unit may be different in each of processing stages. But, Sharman in view of Hata and DIC does not expressly disclose to mark a text unit that does not match the one either in dictionary or by rule sets. However, this feature of marking a text unit data was well known in the art as evidenced by R1, which is a popular computer dictionary that gives common meaning and explanation of words or phrases in computer related arts. R1 further discloses that one of the common meanings of the word "mark" is "in applications and data storage, a symbol or other device used to distinguish one item from others like it" (page 298, entry "mark"), so that when using "mark" as a verb, it can be interpreted as an action to mark a symbol for certain data in a data storage, such as used for "text unit", for distinguishing the data from other data. Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman by specifically marking a text unit of the processed data, as taught by R1, for the purpose of distinguishing the

text unit that is not in the dictionary and preparing for further processing stages, such as processing in a back-up mechanism, generating phonemes, coping with prosodic information (Sharman, column 5, lines 25-26, column 5, lines 30-56 and column 5, lines 26). In addition, there must inherently exist some mechanism to distinguish a word that is not in the dictionary from other word that is in the dictionary in Sharman system, because Sharman suggest using a dictionary lookup and some back-up mechanism for handling the two different situations (column 5, lines 23-25).

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and R1 as applied to claim 7 above, and further in view of O'Donnell ("programming for the world--a guide to internationalization", ISBN 0-13-722190-8).

Regarding **claim 8** (depending on claim 7), Sharman in view of Hata, DIC and R1 does not expressly disclose that "said marking comprises pre-pending a character to said textual unit." However, the further of marking a text unit by using a pre-pending character was well known, as taught by O'Donnell who writes a book of "programming for the world", and discloses that appending a character symbol "$" to a digit string for distinguishing monetary amount from normal number (page 49, table 2.11). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman and R1 by specifically marking a text unit of the processed data by adding a character, such as "$" or the like, in front of the text units, as taught by O'Donnell, for the purpose of easily distinguishing the text units and preparing for further processing.

9. Claims 14-15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and Malsheen et al. (US 4,979,216) hereinafter referenced as Malsheen.

Regarding **claim 14**, Sharman discloses a text to speech system, comprising:

a field for a textual unit, (column 7, lines 59-57 and Table 1, 'output buffer is also used when a component produces several output unit for each input unit that receives'; column 6, lines 59-67, 'the output unit represents the size of the text unit (e.g. word, phoneme)' in several different process stages; which necessary includes data structure and a field for handling the text unit),

a field for speech sample associated with said textural unit, (Fig. 4 and column 6, lines 25-40, 'many samples (speech samples) of each phonemes are collected... for use in the diphone library', 'relevant diphones (associated with the text units) ...are concatenated together by diphone concatenation unit 415 (PSOLA)', which necessary includes data structure and a field for handling the synthesis speech),

wherein said textual units is one of a word, prefix and suffix (column 2, lines 1-2, 'a linguistic processor for generating a listing (list) of speech segments (textual units) ... from the input text'; column 5, lines 18-27, 'removing (separate) **any possible prefix or suffix** (treated as a textural unit) to see if the **word**, is related to one that is already in the dictionary'), and

wherein a processor is capable of using the data structure to locate said associated speech sample associated with said textual unit from a memory comprising a vocabulary of words, prefixes and suffixes and a plurality of speech samples, and to use said associated speech sample to produce an output signal, (column 3, lines 17-18, the TTS system includes two

microprocessors'; column 5, lines 'using a dictionary look-up (necessarily stored in memory)', 'breaking words down into syllables' and 'removing any possible prefix and suffix (also necessarily stored in a buffer or memory in order to produce output speech'; column 6, lines 25-67, 'many samples (associated speech sample) of each diphone are collected'; Table 1 and column 7, lines 54-67, 'the output buffer (memory) is used when a component produces several output units for each input unit that receives', including 'token', 'word', 'phoneme', 'syllable'; column 6, lines 25-67, 'concatenated together (appending) by the diphone (associated sample) concatenation unit 415 (PSOLA)', and 'produces the acoustic waveform (output signal)').

Even though, Sharman discloses using a dictionary look-up for words, break words down into syllables and removing possible prefix and suffix as stated above, Sharman does not expressly disclose "**each speech sample** corresponding to a one of said **words**, ...in said vocabulary". However, this feature is well known in the art as evidenced by Hata who discloses high quality concatenative reading system (title), and teaches "a dictionary of sampled sounds recorded and stored in advance", "the dictionary (including vocabulary) entries can be individual words", "the dictionary of samples may store more elemental speech components, such as individual phonemes" that means the system capable of larger units (such as word) or smaller units (such as phoneme) of speech sample, "whether to store entire words or individual phonemes is largely a system design issue" (column 3, lines 42-65). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman for specifically providing a stored speech sample corresponding to a word or other unit, as taught by Hata, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Even though, Sharman in view of Hata discloses a stored speech sample corresponding to a word (or other unit) in a vocabulary (dictionary), as stated above, Sharman does not expressly disclose "each speech sample corresponding to a one of said ... , **prefixes and suffixes** in said vocabulary". However, the feature that a prefix or suffix being an entry treated as same way as a word in a dictionary is well known in the art as evidenced by DIC that teaches that prefixes and suffixes can be individually treated as entries, just like word entries in a dictionary (see DIC: entries "a-" and "-ability"). Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata for specifically providing a mechanism to treat a prefix or suffix as same way as a word in a dictionary, as taught by DIC, so that each stored speech sample can correspond to one of word, prefix and suffix, for the purpose of selecting the appropriated "granularity" or dictionary entry size to suit the specific application" (Hata: column 3, lines 66-67).

Further, Sharman in view of Hata and DIC does not expressly disclose the data structure having "a field for a frequency of a first portion of the speech sample that exceeds an amplitude threshold, and a field for a frequency of a last portion of the speech sample that exceeds an amplitude threshold," which can be broadly interpreted as a data structure feature having simple data fields for storing a frequency or duration related speech information, since this limitation does not specifically define any type of the data in the data structure design, non describe any relationship with other data fields or incorporation with other system elements. However, this feature is well known in the art as evidenced by Malsheen who discloses the data structures for storing a single phoneme enunciations (column 5, line 65 through column 6, line 26), and having multiple frequency and time (duration) fields (Table 1-4). As best understood in view of

specification (page 9, paragraph 3 and page 10, paragraph 2), the field for a frequency of a first (or last) portion of the speech sample that exceeds an amplitude threshold can be interpreted as zero crossing data, which is inherently related to frequency or duration information about pitch that can be equivalently expressed in frequency, so that Malsheen disclosed data structure having multiple frequency or time (duration) fields can be used for implementing the two claimed data fields. Therefore, it would have been obvious to one of ordinary skill in the art at time the invention was made to modify Sharman in view of Hata and DIC by specifically providing data structures having multiple fields for frequency or time (duration) information for processing and storing speech data, as taught by Malsheen, for the purpose of reducing cost (Malsheen: column 2, line 57).

In addition, in a broader view, a data structure is a template that data can be applied to. For computer and/or microprocessor based devices, data structure is an inherent nature for storing, accessing the required data through associated hardware and/or software functionalities. The claimed data structure includes two general fields for use without any specific data type (such as text, number, length) and any connection to other software and hardware, so that, in fact, any two data elements relating frequency or duration information can apply to the two fields of the template, thus Sharman, Hata, and Malsheen may, either individually or in combine, satisfy the limitation of these to fields.

Regarding **claim 15** (depending on claim 14), the claim only adds two more fields which is interpreted as the template with few more fields that any data can be applied to as stated above (claim 4, last paragraph), so that Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s). In addition, Sharman in view of Hata, DIC and

Malsheen further discloses a phonological feature table (an array type of data structure) 52 (Hata: Fig. 3), comprising fields of phonemes that a word may begin and end with (Hata: column 5, lines 14-31, and column 7, lines 55-59), which further corresponds to the claimed "a field for a phoneme that said textual unit starts with, and a field for a phoneme that the textual unit ends with."

Regarding **claims 19 and 20** (depending on claim 14), the rejection is based on same or similar reason described in claim 14, because these claims only add three more fields which is interpreted as the template with few more fields that any data can be applied to, therefore Sharman and Hata and Malsheen can, either individually or in combine, satisfy the claimed limitation(s).

10. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC and R1 as applied to claims 7 and 12 above, and further in view of Oh.

Regarding **claim 16** (depending on claim 7), the rejection is based on the same reason as described for claim 2, because the claim recites same or similar limitation(s) as claim 2.

Regarding **claim 18** (depending on claim 12), which corresponds to a combination of claims 2 and 7; the rejection is based on the same reason as described for claims 2 and 7, because the claim recites same or similar limitation(s) as claims 2 and 7.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharman in view of Hata, DIC, R1 and O'Donnell as applied to claim 8 above, and further in view of Oh.

Regarding **claim 17** (depending on claim 8), the rejection is based on the same reason as described for claim 2, because the claim recites same or similar limitation(s) as claim 2.

Conclusion

12. Any response to this action should be mailed to:

Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
or faxed to:
(703) 872-9306, (for formal communications intended for entry)
Or:
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (703) 305-5631. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (703) 305-6954.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see http://pair-direct.uspto.gov.

QH/qh
November 10, 2004

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